THE hKCa3/KCNN3 SMALL CONDUCTANCE CALCIUM ACTIVATED POTASSIUM CHANNEL: A DIAGNOSTIC MARKER AND THERAPEUTIC TARGET

Abstract of the Disclosure

The present invention is based on the discovery and cloning of the human small conductance calcium activated potassium channel type 3 (hKCa3/KCNN3) gene, which is expressed in neuronal cells, skeletal muscle, heart, and lymphocytes. Alterations in the hKCa3/KCNN3 gene or its protein product may enhance susceptibility to schizophrenia and/or bipolar disorder. hKCa3/KCNN3 may be involved in neuropsychiatric, neurological, neuromuscular, and immunological disorders. Substantially purified hKCa3/KCNN3 polypeptides and polynucleotides are provided. Antibodies which bind to hKCa3/KCNN3 polypeptides are also disclosed. A method for identifying a compound which affects hKCa3/KCNN3 polynucleotide or polypeptide is provided. A method for diagnosis and determining the prognosis and treatment regimen of a subject having or at risk of having a hKCa3/KCNN3-associated disorder is also provided. A method of treating a subject having or at risk of having an hKCa3/KCNN3-associated disorder by administering a therapeutically effective amount of a polynucleotide encoding SEQ ID NO:2 is also provided. A formulation for administration of hKCa3/KCNN3 to a patient of a therapeutically effective amount of hKCa3/KCNN3 polypeptide is provided. Kits useful for detecting the presence of hKCa3/KCNN3 polypeptide or polynucleotide in a sample from a subject having a hKCa3/KCNN3-associated disorder are provided. Transgenic nonhuman animals having a transgene encoding hKCa3/KCNN3 are also described.